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DYNAMIC EFFECTS OF REMITTANCES ON EXTERNAL RESERVES IN NIGERIA: THE ROLE OF INFLATION AND STRUCTURAL BREAKS

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ABSTRACT

This study provides additional information about the drivers of external reserves in Nigeria. The result using Autoregressive Distributed Lag (ARDL) model estimation approach for the period 1980-2015 shows that remittances, among other macroeconomic variables, increased external reserves in the short run but weakens it in the long run. Remittances depletes external reserves through its effect on inflation rate and the nonsterilized intervention of the Central Bank. Furthermore, regime shift to relatively floating exchange rate causes remittances to increase reserves. From the foregoing, it is important for the authorities to continue operating relatively flexible exchange rate, and curtail excessive spending of remittances.

Keywords: Reserves, Remittances, Commodity Prices, Autoregressive Distribution, Inflation rate.
JEL Classification: F31, F24, C22, F31

INTRODUCTION

The dynamics of external reserves has long been an issue of intense research interest but what drives this dynamic is still a subject of debate. On one hand, some studies identified fiscal and monetary policy instruments as responsible while on the other hand, others documented commodity prices and patterns of capital flows (Dooley, *et al,* 2004; Abeng, 2007; Bankole *et* al, 2011; Bankole and Shuaib 2013).

However, recent experience shows that remittances and oil prices also influence reserves behavior, though the direction of their effect is indecisive (source?). For instance, frequent conversion of remittances to domestic currency could trigger inflation if there is no corresponding increase in domestic production and or if the preference of the recipients is biased towards importation of final goods (source?). Putting inflation under control will require reserve depletion if the authorities embark on nonsterilized intervention. If they embark on sterilized intervention, the outcome depends on the effectiveness of signaling and portfolio channels on exchange rate (source?).

Apart from the monetary policy stance, the effect of remittances on reserves also depends on the type of exchange rate regime operating in the country. Under floating exchange rate, reserves effect of remittances

could be negative in a country with inelastic import demand and elastic exports or ineffective if imports are less inelastic source (?). Under alternative exchange rate regime, the effect is notable, but the direction is indecisive. Interestingly, this theoretical exposition is yet to be captured in the model of external reserve determination.

Incorporating remittances in the model of external reserves will further enrich the understanding of the monetary authorities in ensuring optimal reserve accumulation. This paper focuses on the case of Nigeria for at least three reasons. First, the country is one of the largest holders of external reserves in Africa, due perhaps to its mineral endowment and emigration history, but the dynamics of reserves are characterized with ups and downs. In 1999, Nigerian external reserves' holding was $5.42 billion up from $3.05 billion in 1989. It posted $28.3 billion in 2005, peaked at $53.0 billion in 2008 but fell to $42.4 in 2010 and later rose slightly to $34.2 billion in 2014. The increase could not be maintained as it plummeted to $29.1 billion at the close of 2015 and then below $25 billion in September, 2016.

Does remittances, alongside commodity prices contribute to this instability of external reservers? Preliminary analysis as manifested in the background data shows that when reserves were falling in the 1980s, oil price was also falling. The price of oil rose from $38.0 per barrel (pb) in 1980 to $14.8 per barrel in 1985. In the same period, remittances also fell from $22 million to $4 million. During the recovery period of reserves, precisely in the late 1980s through 1996, oil price and remittances were on the increase. Also, reserves fell from $7.78 billion in 1997 to $7.29 billion in 1998 when oil and remittances fell respectively from $19.5/pb and $1.92 billion to $12.7/pb, and $1.5 billion. The systematic increase in reserves in the early 2000s also occurred during a sudden jump in oil price and astronomical increase in remittances. From 2015 till September, 2016, reserves has been drastically declining following falling prices of oil and a relatively stable remittances.

Second, while appreciable numbers of empirical papers (Yaaba, 2012; Bankole and Shuaib, 2013, Osigwe, 2015; Imarhiegbe, 2015 and Stober, 2016) have investigated the determinants of external reserves in Nigeria, remittances and oil price were missing in their analyses. This could be informed by perceived non-importance of these variables or perhaps dearth of data. Further, very few papers address the methodological issues associated with external reserves model. Those that employed autoregressive distributed lag (ARDL) ignore the influence of trend and exchange rate policy regime (structural break) in their models. But pre-estimation test shows that trend and structural breaks cannot be ignored. Neglecting these problems cast doubt on the efficiency of the coefficients. Hence the present paper seeks to address this issue.

Third, considering the definition of external reserves and the theoretical link of it with remittances, reserves is indirectly affected by remittances through inflation and/or exchange rate (??). However, it is not clear whether the latter channel is more important than the former. This study models the channels and investigated the direction of effect under alternative exchange rate regime. This is the first paper that will carry out such comprehensive exercise in the study of external reserves in Nigeria. Additional reason was informed by the recent declaration of Fitch ratings where remittances were

perceived as a vital source of reserves. In a country like Nigeria where remittances are the largest foreign inflow (after oil revenue) it is important to investigate this claim.

Following the introductory section, the next section presents the stylized facts about reserves and oil price and remittances in the context of exchange rate regime. Section three discusses the review of literature while sections four and five present the result and concludes respectively.

Background information about external reserves and remittances in Nigeria

The behaviour of reserves was not encouraging in the 1980s as it was meted with continuous decline from $4.17 billion in 1981 to $0.22 billion in 1983 (Figure1). The much acclaimed reasons for this downward trend was linked to the protracted crash in the international price of crude oil, weak domestic industrial production, poor performance of the non-oil exports and exchange rate misalignment.

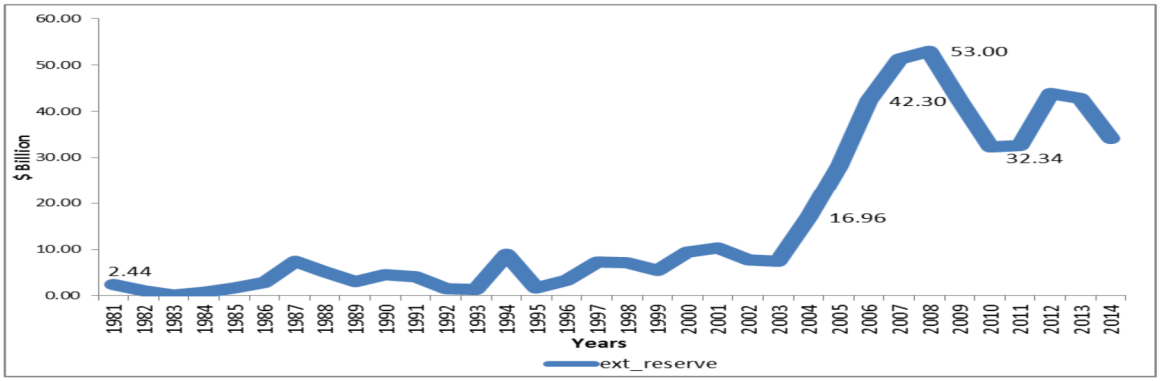

Figure 1: Trends of Nigeria's External Reserves position in US Dollar

Source: Author's Computation from Statistical Bulletin (CBN, 2015)

Figure 2 shows that world oil price recorded a continuous decline from $37.1/pb in 1981 to $15.1/pb in 1988 while Figure 3 shows that the country was operating a managed floating exchange rate during the period. Such exchange rate regime was argued to have raised the real price of export and reduce the real price of imports. The subsequent period witnessed a sustained increase, albeit with some fluctuations. Incidentally, this period also witnessed rising oil price and a switch from managed floating to relatively fixed in the mid-1990s.. Reserves rose from an average of $3 billion between 1989 and 1996 to a significant $7.78 billion in 1997, representing an increase of about 213.7 per cent. Although it fell to $5.42 billion in 1999, it recovered to $9.39 billion in 2000 but fell to $7.68 billion in 2002.

External reserves rose to $16.96 billion and $42.34 billion in 2004 and 2006 respectively, and a moderate increase of 25 percent of 2006 in 2008. Of course disciplined fiscal and monetary policies influenced this remarkable performance, but the influence of low debt burden, increase in remittances and high world crude oil prices could not be ignored. However, in the subsequent years, reserves experienced downward trend, falling

from $53.00 billion in 2008 to $32.34 billion in 2010 after which it rose steadily to $43.33 billion in 2012. One major reason adduced to the decline was the fallout of global economic crisis which affected demand for oil in the global market.

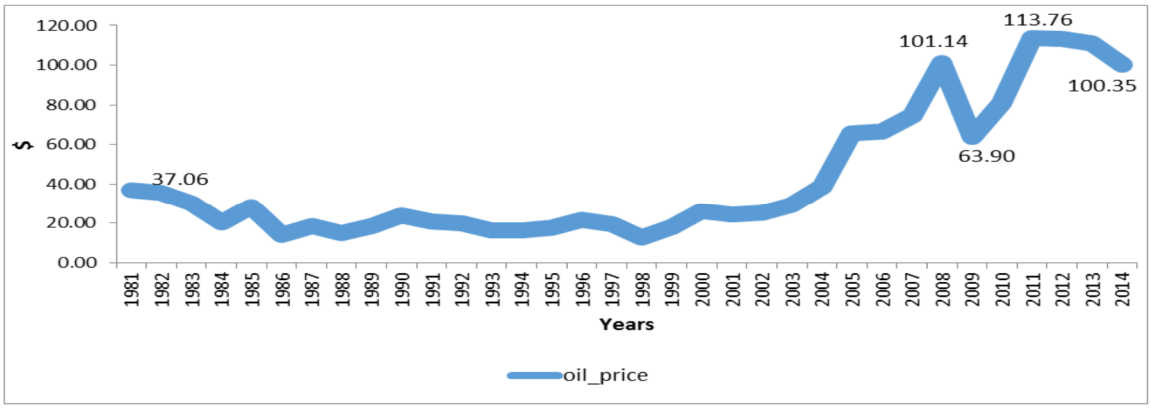

Figure 2: Trend of World Oil Price

Source: Extracted from the World Bank Commodity Price Data (The Pink Sheet); available at data.bank.worldbank.org/data/database/commodity-price-data

It must be recalled that external reserves began to increase when the country abandoned pegged exchange rate to a variant of floating exchange rate (Figure 3). When the country moved to managed floating in the late of 1990s, reserve responded by notable and continuous increase until 2008 when it plummeted. The managed floating caused the exchange rate to jump from 22 naira per dollar in 1998 to 120 naira per dollar in 1999 and the upward movement was maintained before a relatively steady exchange rate appeared from 2004 to 2006.

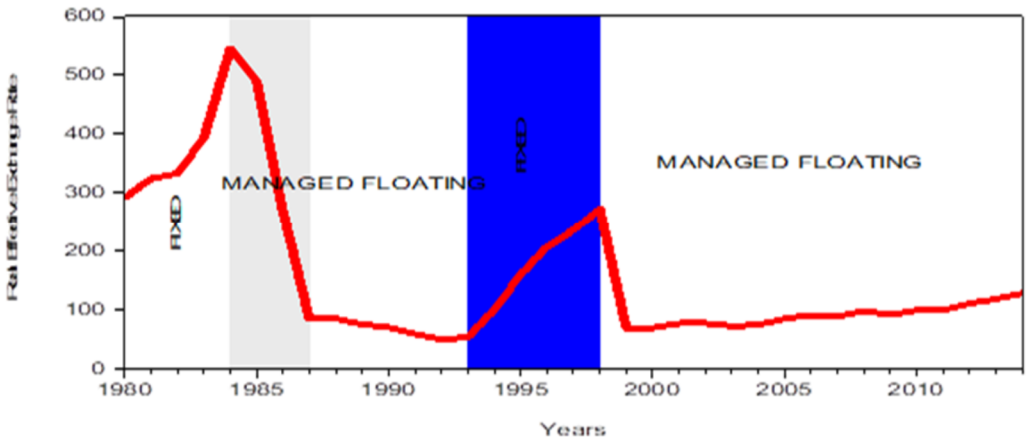

Figure 3: Official Exchange Rate

Remittances to Nigeria was small in the 1980s due to inadequate records of the inflow, small emigration size, absence of transfer institutions, and rigid currency convertibility (Orozco, 2007). But twenty years later, remittances rose to $1.4 billion and in 2013, the country recorded as much as $21 billion (Figure 2.4). The systematic increase in 2000 through 2013 could be informed by improved way of recording remittances, sizable Nigerian emigrants, and the existence of transfer institutions.

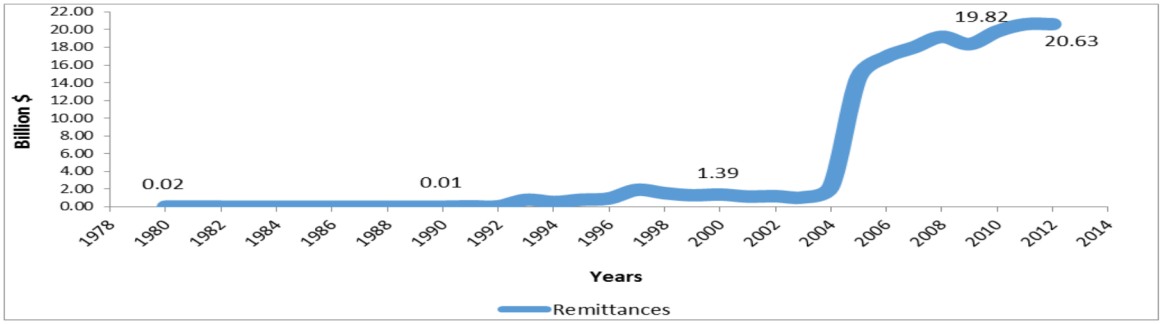

Figure 4: Official Workers' Remittances in Nigeria

Source: Computed using the IMF Balance of Payments Yearbook (2015)

The scatter plot of reserves and oil price indicates a positive relationship (Figure 5). In the same vein, there is a positive relationship between remittances and reserves. However, while the positive relationship of reserves and oil price is direct, the systematic co-movement observed in the remittances-reserve nexus is not. The relationship should be informed by the kind of exchange rate regime, the spending pattern of recipients and the monetary policy choice of the authorities. What can therefore be learned from the graph is that the factors influencing remittances cause it to impact positively on reserve. It is therefore important to investigate the nature of interaction of each of these factors with remittances. The extent to which any of the interactions is significantly established will provide strong support on how remittances can be treated to raise reserve in the face of unstable commodity prices in Nigeria.

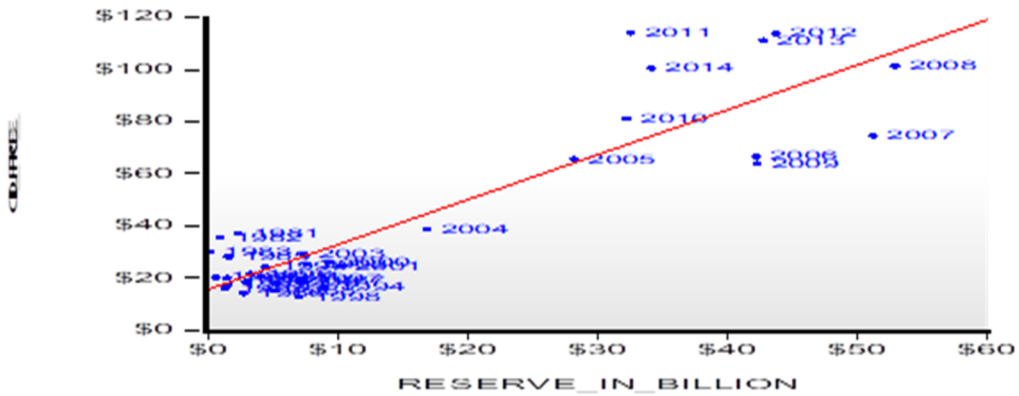

Figure 5: Oil price and Foreign reserves

LITERATURE REVIEW

The review focuses on the two major drivers of reserves and the role of remittances. Investigating the precautionary and mercantilists motive of reserve accumulation, the IMF (2003) estimated a reserve function for a panel of 122 newly industrialized emerging market economies. The study found that fundamental factors such as interest rate differentials and exchange rate are important for reserve accumulation. Gosseling and Parent (2007) show that the level of reserve holdings in Asian Central Banks is determined by GDP, the ratios of imports, broad money, and a break in the coefficient of imports to GDP.

Aizeman and Lee (2005) compare the importance of precautionary and mercantilist motives in the hoarding of international reserves by 53 developing countries between 1980 and 2000. The result shows that a more liberal account regime increases international reserves. They also find supports for precautionary motives particularly for countries facing difficulties. Bastoure, *et al* (2009) use a panel of 139 countries for the period 1973 and 2003 to demonstrate the need for using both a dynamic specification of demand for reserves using the System Generalized Method of Moments (SYS -GMM) estimator. They highlighted that the opportunity cost, exchange rate regime, and financial volatility are statistically insignificant while openness, regional limitation, persistence, and global financial deregulation strongly drive reserves

Following the fear of floating mooted by Calvo and Reinhart (2002), Kim, *et. al*. (2011) developed a cost-benefit approach that helps to quantify the optimal level of international reserves in low-income countries and applied it to 49 low income economies in 1980-2000 period. They found that countries with fixed exchange rate tend to accumulate reserves to mitigate external shocks. Using the autoregressive distributed lag (ARDL) approach between 1996 and 2010, Shijaku (2012) found supports for the precautionary motive in Albania.

Very recent empirical evidence in Nigeria abound. Chinaemerem and Ebiringa (2012) focus on the interconnectedness between reserves and macroeconomic variables. Their results show that reserve can be explained by capital goods, final goods, exchange rate and GDP. Charles-Anyaogu (2012) investigated the causality effect of macroeconomic variables in reserve between 1980 and 2009 and reports that there was a long-run relationship between reserves and its determinants such as GDP, trade openness, exchange rate and inflation. In the same vein, Onikola (2012) found GDP, exchange rate, trade and oil production to matter for reserve accumulation. Irefin and Yaaba (2012) employed ARDL approach to estimate a modified buffer-stock model of Frenkel and Jovanovic (1981) for Nigeria using quarterly data from 1980 to 2011. Their result did not support the buffer-stock theory because importation reduces reserve accumulation.

Imarhiagbe (2015) modelled a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) and Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) to investigate the effects of oil price variability and found a positive effect of oil price on external reserve. Stober (2016) uses long run VECM and short run Granger Causality/Block exogeniety to examine the rate of convergence of foreign reserve, oil price and exchange rate following a shock. He showed that external reserve

will take 5 years, oil price will take 4 years while exchange rate will take 96 years to converge to steady state. Further, 1 percent increase in oil price leads to 1.8 percent increase in reserves. Instead of using oil and nonoil prices, Osigwe et al (2015) incorporated the (current) values of oil and nonoil exports, exchange rate and other macroeconomic variables in their error correction model. All variables except exchange rate positively influence foreign reserves. However, nonoil export failed to drive foreign reserves.

Very few researchers incorporated remittances in their reserve determinants. Narayan *et al* (2011) lend credence to this in their study of 54 developing countries between 1995 and 2004 with the aid of SYS-GMM. However, the inflationary effect is inconclusive in Mexico because while it is more for a number of tradable goods, it is less effective in durable goods. Amuedo-Dorantes and Pozo (2004) report that in a panel of 13 Latin American and Caribbean countries, workers' remittances triggers exchange rate, thereby reducing the countries' international competitiveness. The reduction in exports proceeds reduces reserves. Acosta, *et al* (2009) focuses on the type of Dutch disease that remittances could cause. In their study of El Salvador, they discovered that inflow of remittances lead to increase in the prices of nontradable goods, culminating in reallocation of labour away from tradeable sector. In this case, the effect on reserve is unclear. On the one hand, remittances lead to appreciation, thus making import cheaper and export more expensive. On the other hand, since much of remittances are spent on non -tradable goods, reserve may not likely plummet but inflation may be expected, except the domestic production base is capable of meeting the demand shock generated by remittances.

Vacaclores *et al* (2012) carry out a study that examines the direct effect of remittances on reserves. Employing dynamic panel data for a group of 9 Latin American countries in the period 1997-2010, it was discovered that reserves are influenced by trade surplus, exchange rate depreciation, interest rate differentials, commodity price changes and remittance. Out of these variables, remittances exerted strongest positive impact on reserves.

The review of literature on the effectiveness of remittances on reserves is no doubt scanty. However, the empirical literature on the determinants of reserves and various macroeconomic implications of remittances show that the exclusion of remittances in reserves model is inadequate (??). Generally, the resultant effects of remittances on reserves are diverse. In the developing countries, the results are not the same, not only in magnitude but also in direction and significance. What really drives the effectiveness of remittances on reserve depend on the size of the country, the spending pattern of remittance receivers, the effectiveness of the monetary authorities, the exchange rate regime and the relative importance of the economy in the world market (??). While accepting that the empirical result is scanty, it is surprising that the evidence for Nigeria is missing, despite its position in the world remittance table, improved economic performance, and large reserve position. Thus this study seeks to fill this empirical gap by revisiting the effect of internal and external factors on reserve accumulation with special focus on remittances.

MATERIALS AND METHODS

The theoretical and empirical literature such as Calvo and Reinheart (2012), Stober (2016) and Valcadores et al. (2012). show that the factors driving external reserves can be classified into internal and external. The internal factors include monetary and fiscal policy instruments in which monetary growth, government spending and control of inflation. External factors include interest rate differential as a proxy for the influence of capital flow (portfolio investment), commodity price (that is, oil and gas prices) and remittances. Given these variables, the relationship between international reserve and the variables that determine it is as follows:

$$RES = F(GOVT, INFLA, MONEY\_GROWTH, INTDIFF, OIL\_PRICE, GAS\_PRICE, REM, X) \quad 1$$

Where: RES is the stock of foreign reserves, INFLA is inflation rate, MONEY_GROWTH is the growth rate money supply, GOVT is total government expense, INTDIFF is interest rate differentials, which is the difference between the lending rate of Nigeria and the US treasury bill rate, OIL_PRICE is oil price while GAS_PRICE and REM represent liquid gas price and remittances respectively. All other control variables such as inflation rate, external debt stock and external debt service are captured by X. The econometric specification of equation 1 is given as follows:

$$RES = \alpha_0 + \alpha_1 GOVT + \alpha_2 INFLA + \alpha_3 MONEY\_GROWTH + \alpha_4 INTDIFF + \alpha_5 OIL\_PRICE + \\ + \alpha_6 GAS\_PRICE + \alpha_7 REM + X\beta + \varepsilon_t) \quad 2$$

There are at least three major estimation issues that need to be addressed in equation 2. First, the stock of reserve is fraught with inertia. Most empirical works on reserves tend to ignore this important characteristic. Ignoring the underlying inertia in reserves may lead to biasedness and inconsistency. Second is the existence of endogeneity among the regressors. Also, there could be within and between effect of the internal and external variables. Furthermore, some of the variables could be affected by time, that is, the behavior of the variable could be due to exponential trend. Generally, these series exhibit nonstationarity. There are several techniques of detecting and controlling for nonstationarity. These include the Dickey-Fuller (DF) and Augmented Dickey -Fuller (ADF) unit root test, the Phillip-Perron (PP), the Kwatsowski-Phillips-Schmidt-Shin (KPSS), Elliot-Rotherberg-Stock (ERS) point optimal. The ERS optimal is useful for a sample of 50 and above observation and cannot be useful for this study. The null hypothesis in the DF, ADF and PP is that the series have no unit root. That is, the series is stationary at the level. This null hypothesis is the converse in the case of the KPSS. We employed the ADF unit root test for this study not only because its result is closely similar to the PP but also that it is commonly used in the literature.

Since the series exhibit different level of integration, as shown in the next section, an autoregressive distributed lag (ARDL) proposed by Perasan *et al* (2001) estimation technique was employed. According to Greene (2005), ARDL are standard least squared regressions that incorporate lags of both the regressands and the regressors in a single model. Several advantages are associ-

ated with the use of ARDL. First, it has a built-in bound testing for investigating cointegrating relationship. Second, it is capable of dealing with endogeneity problems and has the ability to test the long run estimates which is not possible under alternative cointegrating techniques (Sezgin and Yildrim, 2002). Further, the small sample properties of the ARDL are by far superior to other forms of multivariate cointegration (Halicioglu, 2007). Finally, the method has gained popularity in recent years for examining long run and cointegrating relationship between variables.

The basic ARDL model is specified in equation 3. As noted, some of the regressors, X_j may have no lagged terms, such that q_j = 0. Thus the term $\sum_{i=0}^{q_j} X_{jt-i}$ contains both static and dynamic regressions.

$$Y_t = \alpha + \sum_{i=1}^{\rho} \pi_i Y_{r-i} + \sum_{j=1}^{\kappa} \sum_{i=0}^{q_j} X_{jt-i}' \beta_{j,i} + \varepsilon_t \quad \ldots\ldots 3$$

In order to determine the appropriate lags for the dependent and independent variables, Schwartz Criterion (SC) was employed to automatically select the numbers of lag length that will enter the model. The SC was chosen because it places high penalty on increasing the numbers of regressors. It follows that the ARDL does not require symmetry lag lengths, that is, each variable can have a different numbers of lags (Pesarsan and Shin, 1999). Meanwhile, the long run transformation of the dynamic relationship was done, given the estimated long run coefficient to be.

$$\theta_j = \frac{\sum_{j=1}^{\kappa_j} \hat{\beta}_{j,i}}{1 - \sum_{i=1}^{\rho} \pi_i} \quad \ldots\ldots 4$$

Hence the cointegrating regression form is obtained by transforming equation 3 into differences and substituting the long run form, that is, equation 4 to produce equation 5

$$\Delta Y_t = -\sum_{i=1}^{\rho-1} \pi_i^* \Delta Y_{t-1} + \sum_{j=1}^{\kappa} \sum_{i=0}^{q-1} \Delta X_{j,t-i}' \beta_{j,i}^* - \hat{\phi} \text{coninteq}_{t-1} + \varepsilon_t \quad \ldots\ldots 5$$

Note that $\text{coninteq}_{t-1} = Y_t - \alpha - \sum_{j=1} X_{j,t}' \hat{\theta}_j$

And that $\hat{\theta} = 1 - \sum_{i=1}^{\kappa} \hat{\pi}_i$,

$$\pi_i^* = \sum_{m=i+1} \hat{\pi}_m \quad ;$$

$$\beta_{j,i}^* = \sum \beta_{j,m}$$

The bound test procedure transforms equation 5 into

$$\Delta Y_t = -\sum_{i=1}^{\rho-1} \pi_i^* \Delta Y_{t-1} + \sum_{j=1}^{\kappa} \sum_{i=0}^{q_{j-1}} \Delta X_{j,t-i}' \beta_{j,i}^* - \rho Y_{t-1} - \alpha - \sum_{j=1}^{\kappa} X_{j,t-1}' \gamma_j + \varepsilon_t \quad \text{.....6}$$

In the event that there is level relationship, that is, $\varrho = 0$, this implies that

$\gamma_1 = \gamma_2 = ... = \gamma_\kappa = 0$

It suggests that the model does not have long run relationship and so, the short run dynamics will be estimated. Using equations 3 and 5 or 6, the ARDL, cointegration and long run forms of equation 1 is specified`in their respective logarithmic forms in equations 7, 8 and 9.

The ARDL form

$$\ln Y_t = \alpha_0 + \sum_{i=1}^{\rho} \pi_i \ln Y_{t-i} + \sum_{i=0}^{q_1} \beta_i \ln X_{1t-i} + \sum_{i=0}^{q_2} \delta_i X_{2t-i} + \sum_{i=0}^{q_3} \eta_i X_{3t-i} + \sum_{i=0}^{q_4} \lambda_i \ln X_{4t-i} + \sum_{i=0}^{q_5} \vartheta_i \ln X_{5t-i} +$$

$$+ \sum_{i=0}^{q_6} \tau_i \ln X_{6t-i} + \sum_{i=0}^{q_7} \varsigma_i X_{7t-i} + \sum_{i=0}^{q_8} \xi_i \ln X_8 + \sum_{i=0}^{q_9} \psi_i \ln X_9 + \sum_{i=0}^{q_{10}} \psi_i \ln X_{10} + \varepsilon_t \text{.....7}$$

ARDL cointegrating form

$$\Delta \ln Y_t = \alpha_0 + \sum_{i=1}^{\rho} \pi_i \Delta \ln Y_{t-i} + \sum_{i=0}^{q_1} \beta_i \Delta \ln X_{1t-i} + \sum_{i=0}^{q_2} \delta_i \Delta X_{2t-i} + \sum_{i=0}^{q_3} \eta_i \Delta X_{3t-i} + \sum_{i=0}^{q_4} \lambda_i \Delta \ln X_{4t-i} + \sum_{i=0}^{q_5} \vartheta_i \Delta \ln X_{5t-i} +$$

$$+ \sum_{i=0}^{q_6} \tau_i \Delta \ln X_{6t-i} + \sum_{i=0}^{q_7} \varsigma_i \Delta X_{7t-i} + \sum_{i=0}^{q_8} \xi_i \Delta \ln X_8 + \sum_{i=0}^{q_9} \psi_i \Delta \ln X_9 + \sum_{i=0}^{q_{10}} \psi_i \ln X_{10} + \theta cointeg_{t-1} + \varepsilon_t \text{.....8}$$

The long run form

$$\ln Y_t = \alpha_0 + \xi_1 \ln X_1 + \xi_2 X_2 + \xi_3 X_3 + \xi_4 \ln X_4 + \xi_5 \ln X_5 + \xi_6 \ln X_6 + \xi_7 X_7 +$$

$$+ \xi_8 \ln X_8 + \xi_9 \ln X_9 + \xi_{10} \ln X_{10} + \varepsilon_t \text{.....9}$$

Where Y_t = external reserves (RES), X_1 = Government expenses (GOVT); X_2 = Inflation rate (INFLA); X_3 Interest rate differentials (INTDIFF) ; X_4 = Real effective exchange rate (RER) ; X_5 = External Debt Service (DEBTSERV) X_6 = Stock of external debt (EXDEBT); X_7 = Growth of money supply (MONEY_GROWTH); X_8 = Price of liquid gas (GAS_PRICE); X_9 = Workers' remittances (REM) and X_{10} = oil price

Definition of variables and sources of data

Reserve (RES) is defined as the sum of foreign exchange holdings, the reserve position at the International monetary fund (IMF) and special drawing rights. The effect of money supply (M2) on reserves depends on whether the authority uses open market operation or foreign exchange operation. In the case of the latter, if the authorities wish to supply more money into circulation, this can be done by selling naira in exchange for foreign currency and hence increase in reserve. This suggests that changes in money supply is expected to be positively associated with external reserves. But if open market operations were used, we do not expect any significant effect of such monetary policy on external reserve. Inflation rate (INFLA) is measured as the percentage change in GDP deflator (using 2010 as the base year). Increase in inflation is expected to increase nominal price of exports and import goods. The overall effect depends on whether inflation reduces exports more than imports or not. A negative effect will suggest that inflation reduces exports more than it reduces imports. If the monetary authorities embark on open market operations or if the authorities embark on non-sterilization, inflation is expected to impact negatively on reserve. Interest rate differential (INTDIFF) is used to investigate the extent to which international capital mobility, in this case, foreign portfolio investment, contribute to reserve behaviour. All things being equal, positive difference will increase reserves. The effect of exchange rate (RER) on reserve could be negative or positive depending on the spending pattern of economic agents on one hand, and the exchange rate regime on the other hand. The effect of foreign debt is unambiguously positive while the servicing of the debt should be negative.

The effect of remittances on reserve is also open. It depends on the spending pattern of recipients, and the monetary policy stance. This implies that remittances may not directly affect reserves. To this end, we interact remittances with some variables such as inflation, exchange rate and structural break. What informs this association, particularly in the case of structural break is to capture how remittances influence reserves during alternative exchange rate regime.

Data on reserves, foreign debt, debt service, money supply, GDP deflator and lending rate were extracted from the Central Bank of Nigeria Statistical Bulletin (2015). Data on foreign interest rate (US Treasury bill rate) were sourced from the World Development Indicators (WDI, 2016) while data on remittances were extracted from the IMF Balance of Payments Yearbook (2015). Data on oil and gas prices were taken from the World Bank commodity price (pink sheet), published by the World Bank. The period of data collection span from 1980 to 2015.

RESULTS AND DISCUSSIONS

The descriptive statistics of the variables is presented in Table 1. All the variables are in logarithmic transformation except inflation rate, exchange rate differentials and monetary growth rate. The average growth of remittances was 6.2 while the maximum and minimum growths were 9.9 and 0.9 respectively.

Table 1: Descriptive Statistics of the variables

Variables	Mean	Maximum	Minimum	Observations
PRICE OF GAS	1.46	2.60	0.74	35
GOVERNMENT SPENDING	1.64	11.90	-23.93	35
INFLATION RATE	19.74	72.84	5.38	35
INTEERST RATE DIFFERENTIALS	9.73	25.65	-9.95	35
EXTERNAL DEBT SERVICE	21.13	22.90	19.49	35
EXTERNAL DEBT STOCK	23.62	24.33	22.04	35
REAL EFFECTIVE EXCHANGE RATE	4.82	6.30	3.91	35
EXTERNAL RESERVES	22.67	24.70	20.65	35
MONEY GROWTH	25.34	64.92	1.95	35
PRICE OF OIL	3.49	4.72	2.54	35
REMITTANCES	6.16	9.94	0.89	35

External reserves experienced an average growth of 22.7 and the respective maximum and minimum growth were 24.7 and 20.7. Minimum inflation rate was 5.3 percent while the maximum was 72.8 percent. The average growth of commodity prices, that is, oil and gas, were 3.5 and 1.5 respectively, an indication that oil price grew faster than gas price. The average growth of stock of external debt service and debt stock were 21.1 and 23.6 respectively. Government spending grew at an average of 1.6 with a maximum growth of 11.9 and a minimum of -23.9. Overall, monetary growth rate was the fastest, followed by the growth of stock of external debt and then inflation rate. It is also of note that external debt grew faster than external reserves.

Table 2: Pairwise Correlation coefficients of the variables

	GAS	GOVT	INFLA	INTDIFF	LNDEBTSERV	LNEXDEBT	LNRER	LNRES	MON-EY_GROWTH	OIL	REM
GAS	1										
GOVT	0.109	1									
INFLA	-0.4595*	-0.0157	1								
INTDIFF	0.0171	-0.1241	0.2249	1							
LNDEBTSERV	-0.5429*	-0.0066	0.1916	-0.227	1						
LNEXDEBT	-0.8216*	-0.2624	0.3973*	0.262	0.4122*	1					
LNRER	-0.0145	0.0774	-0.185	-0.8014*	0.1493	-0.15	1				
LNRES	0.8373*	0.0953	-0.5345*	0.271	-0.5278*	-0.6514*	-0.257	1			
MON-EY_GROWTH	-0.0368	0.0953	0.1644	0.307	0.0514	-0.13	-0.5038*	0.084	1		
OIL	0.9695*	0.1558	-0.4485*	0.034	-0.5525*	-0.7893*	-0.06	0.8468*	-0	1	
REM	0.6670*	0.0604	-0.2195	0.5469*	-0.4973*	-0.4359*	-0.3547*	0.8612*	0.14	0.6636*	1

*Note: * implies significant at 5%*

This occurred in 1992

The purpose of computing correlation matrix was to identify possible multicolinearity among the regressors as they appear in the model. A correlation coefficient of more than 0.6 for any pair of variables, both appearing as regressors will generate multicolinearity in the model. In a case like this, the affected pair of variables will enter the model one after the other. The result shown in Table 5.2 indicates that external debt and oil prices are strongly correlated (r = 0.82). In the same vein, commodity prices are also strongly correlated (r = 0,94).

Other strongly correlated pairs of regressors include interest rate differential and real effective exchange rate (0.8), oil price and external debt (0.79). Since oil price and gas price are major variables in the model, each of them was introduced subsequently. Also, interest rate differential and exchange rate entered the model one after the other. The same thing goes for external debt and oil price. Meanwhile, oil price is retained from the point of considering the influence of external factor while debt stock was dropped. The reason for retaining oil price in the subsequent models is justified on its importance of the paper. Furthermore, gas price was dropped because its growth was less than that of oil price and preliminary regression model found insignificant effect on reserve. Exchange rate was retained in the subsequent regression models because of its interaction with remittances.

Pre-estimation tests

Before the presentation of the regression results, some tests were carried out in order to establish the nature of the series and also to determine the existence and the numbers of exchange rate breakpoints. The breakpoint is important because the effect of remittances on reserve partly depends on the type of exchange rate regime implemented by the monetary authorities, noting that Nigeria exchange rate has experienced both fixed and various types of floating exchange rate.

Table 3: Bai-Perron Global Breakpoint determination

Sequential F-statistic determined breaks:			5	
Significant F-statistic largest breaks:			5	
UDmax determined breaks:			1	
WDmax determined breaks:			5	
Breaks	F-statistic	Scaled F-statistic	Weighted F-statistic	Critical Value
1 *	42.028	42.028	42.028	8.58
2 *	30.754	30.754	36.547	7.22
3 *	22.549	22.549	32.462	5.96
4 *	19.725	19.725	33.915	4.99
5 *	26.897	26.897	59.022	3.91
UDMax statistic*		42.02814	UDMax critical value**	8.88
WDMax statistic*		59.02207	WDMax critical value**	9.91

* Significant at the 0.05 level.
** Bai-Perron (Econometric Journal, 2003) critical values.

Estimated break dates:
1: 1987
2: 1987, 1994
3: 1987, 1994, 1999
4: 1987, 1994, 1999, 2008
5: 1987, 1994, 1999, 2005, 2010

There are many ways of identifying the existence and numbers of breakpoint but the most commonly used are the Quandt-Andrew unkown breakpoint (QAUBP). This test shows the existence of the major breakpoint only, but will not show the number of breakpoint in the period. The result (not shown here) shows that there exist policy shift in exchange rate of Nigeria and the major one was in 1987. This period coincided with the period of exchange rate devaluation. The Bai-Perron Multiple Breakpoint (B-PMB) also confirms that 1987 was the major exchange rate policy shift in Nigeria between 1980 and 2015.

While the QUABP and B-PMB identified the major policy shift in exchange rate policy, the Bai-Perron Global Breakpoint (B-PGB) provided information about the numbers of breakpoints between 1980 and 2015 (Table 3). It must be noted that the B-PGB identifies a maximum of five (5) breakpoints in a time period, thus, the five breakpoints are 1987, 1994, 1999, 2005 and 2010. These dates correspond with when Nigeria switched to flexible exchange rates. Hence given the existence of structural breaks, which coincided with the period of switch to varieties of flexible exchange rate, a break variable was introduced into the model with a period of the break (implying when flexible exchange rate was in operation) was assigned 1 and 0 otherwise.

The result of the ADF is presented in Table 4. Each of the series was tested on three scenarios, namely, no intercept and trend, presence of intercept alone and presence of intercept and trend. The reason for this is that the behavior of a series may be due to exponential growth/decay. If trend scenario is not included, the series will behave as if it is stationary at first difference, whereas it can be stationary once the trend is accounted for.

Table 4: Augmented Dickey-Fuller Unit root test

Variables	Level			First Difference			
	None	Intercept	Intercept and Trend	None	Intercept	Intercept and Trend	Remark
GAS	-0.426	-0.599	-1.864	-5.949***	-5.930***	-6.195***	I(1)
GOVT	-6.281***	-6.755***	-6.648***	-12.018***	-11.831***	-11.638***	I(0), I(1)
INFLA	-1.787*	-2.802*	-3.417*	-5.876***	-5.776***	-5.748***	I(0), I(1)
INTDIFF	-0.651	-2.555	-2.066	-5.732***	-5.840***	-6.110***	I(1)
LNDEBTSERV	-0.383	-1.735	-2.723	-4.964***	-4.917***	-4.884***	I(1)
LNEXDEBT	-0.099	-2.065	-2.534	-4.133***	-4.063***	-4.051**	I(1)
LNRER	-0.631	-4.901	-1.736	-4.374***	-4.326***	-4.343***	I(1)
LNRES	-0.456	-0.623	-3.724**	-4.912***	-4.944***	-4.663***	(0), I(1)
MONEY_GROWTH	-1.901**	`-3.740***	-3.601**	-5.732***	-5.623***	-5.548***	I(0), I(1)
OIL	-0.598	-0.374	-1.992	-5.836***	-4.433***	-5.148***	I(1)
REM	-1.205	-0.521	-3.152	-2.337**	-2.573	-5.941***	I(1)
BREAK	-0.682	-2.271	-2.296	-5.658***	-5.625***	-5.574***	I(1)

*Note: *,**,*** implies ADF statistics exceeds critical values at 10%, 5% and 1% respectively*
**MacKinnon (1996) one-sided p-values.*

Table 4. shows that four out of the twelve series were stationary at levels when intercept and or trend are accounted for while the rest series were stationary at first difference. It is clear from the ongoing that these series exhibit different levels of statinarity with the maximum difference being one. This outcome justified the use of Autoregessive distributed lag (ARDL) modeling approach.

Table 5: Bounds Tests

Model	Test Statistics	Value	k		Critical Value Bounds Significance								
					10%	5%	2.50 %	1%		10 %	5%	2.50 %	1%
Model 2	F-statistic	3.436***	6		2.5	2.9	3.19	3.6		3.6	4	4.38	4.9
Model 3	F-statistic	15.609****	8	I(0) Bound	2.3	2.6	2.82	3.2	I(1) Bound	3.3	3.7	4.02	4.4
Model 4	F-statistic	3.604****	8		2.3	2.6	2.82	3.2		3.3	3.7	4.02	4.4
Model 5	F-statistic	1.887*	10		1.8	2.1	2.28	2.5		2.9	3.2	3.5	3.9
Model 6	F-statistic	2.109**	10		1.8	2.1	2.28	2.5		2.9	3.2	3.5	3.9

Note: *,**,***,**** implies significance at 10%, 5%, 2.5% and 1% respectively

The result of the ARDL model specified in equation 7 for each model is presented in Table 5. The bound tests that show whether there is long-run relationship among the series. The Table shows that for each model, the null hypothesis of no long-run relationship is rejected at various levels of significance.

The result reveals that government spending have no significant impact on external reserve in the short run unlike in the long run when the impact was significant. Specifically, around 0.2% decrease in reserve would be observed when the long run government spending rose by 10%. The reason for the insignificance in the short run could be traced to the use fiscal instrument such as the sale of Treasury bills rather than the use of reserve to influence the economy. In a case like this, the spending pattern will not affect reserve, particularly if the Treasury Bills were sold to domestic investors. Of course government's major source of revenue is from oil proceeds but as noted earlier, only a portion of this is monetized. Hence, reserve may not be affected following changes in government spending since government expenditure and how it will be financed is spelt out in the budget. During fiscal expansion, government may decide to sell Treasury Bills instead of increasing allocation through reserve depletion. In fact, allocation can increase without necessarily depleting reserve if the oil market is doing fine. In the long run, government may decide to raise the share of the reserve in the federation account even when oil proceeds

in not increasing, or retain the allocation share when reserve is not increasing or the reduction in the share of federal allocation is much less than the reduction in external reserve. In any of these cases, fiscal expansion will necessitate reserve depletion.

Monetary policy instrument, that is, the growth rate of money has a significant short run effect only. This suggests that the monetary authorities embark on nonsterilized intervention, most often than none. It must be recalled that part of the reserve is kept with the Central Bank of Nigeria (CBN). And it is for inflation control and economic stimulation, and to defend the naira. In particular, if the target of the authorities was to reduce inflation, caused by remittances, they could do this by selling foreign exchange at the international market, and this will lead to reduction in reserve. This could explain the reason for positive effect of money growth on reserve. Not surprisingly, this arrangement produces mild effect on reserve because of the short run result shows that monetary contraction of 10% will only influence a decline of 0.2% on reserve. The mild effect clearly shows that monetary authorities seldom use reserve as a control mechanism for internal balance.

Following from the above explanation, it is clear that the monetary authorities rarely use nonsterililzed intervention to control inflation. This is further supported by the effect of inflation on reserve that is negative but mild. Meanwhile, reserve can be affected by inflation through importation. In this case, increase in import demand could generate increase in general price level, and to curb the excess money supply will require the sale of foreign exchange and hence reduction in reserve. It must be noted that high inflation is detrimental to Nigeria reserve both in the short and in the long run.

Interest rate differential could not significantly affect reserve in Nigeria because investors consider other factors such as security, contract enforcement, or the embodiment of governance institution apart from stock return, dictated by high interest rate. Specifically, although the motive for portfolio investment is high returns on liquid asset, investors are conscious of dysfunctional governance institution, particularly insecurity and lack of rule of law in any prospective country. In addition to this, if the economy of the investor is experiencing downturn (if income is low), high foreign interest rate, where the investor could invest may not motivate investment. Nigeria spate of governance institution is unnecessarily low, and this could scare investors even in the face of high interest rate. This situation tends to render the effectiveness of interest rate differential on external reserve in Nigeria. Meanwhile, the sign of the coefficient conforms to the theory, in which case, relatively high domestic interest rate shows a sign of increase in Nigeria reserve.

Table 6: Cointegrating form / Parsimonious ECM of the effects of commodity prices and remittances on external reserves

Variables	Model 1: ARDL(1, 0, 1, 0, 0, 0, 2)	Model 2: ARDL(1, 0, 0, 1, 0, 0, 2)	Model 3: ARDL(1, 2, 2, 1, 2, 1, 1, 0, 1)	Model 4 : ARDL(1, 0, 0, 1, 2, 0, 1, 1)	Model 5 : ARDL(1, 0, 0, 0, 0, 0, 0, 1, 0,, 0)	Model 6: ARDL(1, 1, 0, 1, 0, 0, 0, 1, 1, 1, 1)
D(GOVT)	0.012	0.017	0.003	0.008	0.011	0.011
	(0.008)	(0.047)	(0.006)	(0.007)	(0.007)	(0.010)
D(INFLA)	-0.021***	-0.028***	-0.018***	-0.021**	-0.018**	-0.023***
	(0.004)	(0.004)	(0.003)	(0.004)	(0.006)	(0.008)
D(INTDIFF)	-0.017					
	(0.016)					
D(RER)		0.001*	0.002**	0.004***	0.004***	0.012**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.004)
D(LNDEBTSERV)	-0.137*	-0.121**	-0.098***	-0.141**	-0.241***	-0.233***
	(0.072)	(0.060)	(0.018)	(0.051)	(0.068)	(0.069)
D(LNEXDEBT)	-0.163**	-0.476***	-0.991***			
	(0.057)	(0.104)	(0.229)			
D (MON-EY_GROWTH)	0.008*	0.006**	0.003*	0.006*	0.009**	0.015***
	(0.005)	(0.003)	(0.002)	(0.003)	(0.003)	(0.004)
D(GAS)			0.019			
			(0.185)			
D(REM)			0.113**	0.171**	0.170**	0.345**
			(0.051)	(0.061)	(0.072)	(0.142)
D(OIL(-1))				0.512**	0.727***	0.756**
				(0.222)	(0.167)	(0.291)
D(INFLA * REM)					-0.001	-0.005**
					(0.001)	(0.002)
D(REM * RER)					0.011***	
					(0.001)	
D(BREAK)						0.233
						(0.493)
D(BREAK * REM)						-0.259**
						(0.089)
D(@TREND())	0.101***	0.104***	0.163***	0.121***	0.054**	0.015***
	0.022	0.013	0.017	0.023	0.001	(0.005)
CointEq(-1)	-0.736***	-0.295**	-0.392***	-0.977***	-0.481***	0.354**
	0.197	0.114	0.116	0.129	0.001	(0.163)
Included observa-tions	33.	33	33	33	34	34
Adjusted R-Squared	0.916	0.927	0.921	0.941	0.976	0.982

The explanation on the negative effect of external debt services on reserve is straightforward. Since servicing external debt requires paying a certain amount of foreign currency, it follows that increase in debt servicing will lead to reserve depletion. A percentage increase in external debt service will lead to 0.2% decrease in external reserve. Thus although external debt service negatively influences reserves, its effect is minimal. Meanwhile, increase in external debt stock raises external reserve. In the short run, the effect was much (0.9) while in the lung run, the effect was moderate (0.4). Nigeria's external debt stock has been on the increase ever since, even after a two-third reduction in 2006. Such increase will necessarily lead to increase in reserve.

Table 7: Long run effects of commodity prices and remittances on external reserves

Variables		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
GOVT		0.016	-0.016**	-0.029*	-0.049**	-0.011**	-0.016***
		(0.012)	(0.007)	(0.015)	(0.020)	(0.004)	(0.005)
INFLA		-0.012**	-0.026***	-0.015***	-0.021***	-0.020***	-0.020**
		(0.006)	(0.003)	(0.003)	(0.003)	(0.006)	(0.007)
INTDIFF		-0.023					
		(0.022)					
LNDEBTSERV		0.186*	0.111*	-0.136***	-0.144**	0.258***	0.202***
		(0.101)	(0.057)	(0.053)	(0.050)	(0.066)	(0.067)
LNEXDEBT		-0.223**	-0.435***	-0.351**			
		(0.085)	(0.075)	(0.157)			
MONEY_GROWTH		0.002	-0.004	0.003	-0.006*	0.008*	-0.004**
		(0.008)	(0.004)	(0.003)	(0.003)	(0.004)	(0.002)
RER			-0.002***	-0.002**	-0.005***	-0.004***	-0.002**
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GAS				0.994			
				(0.241)			
REM				-0.115**	-0.127***	-0.150*	-0.102***
				(0.045)	(0.015)	(0.088)	(0.028)
OIL					0.355***	0.475***	0.49***
					(0.091)	(0.133)	(0.022)
REM*INFLA						-0.001	-0.002
						(0.001)	(0.002)
REM*RER						0.001***	
						(0.000)	
BREAK							2.356***
							(0.732)
BREAK*REM							-0.420***
							(0.113)
CONSTANT		21.949***	29.793***	52.522***	35.841***	18.875***	19.406***
		(4.980)	(2.171)	(5.194)	(4.227)	(3.070)	(4.514)
@TREND		0.138***	0.095***	0.149***	0.124***	0.070**	0.013
		(0.018)	(0.008)	(0.020)	(0.026)	(0.025)	(0.041)
Test	*Diagnostic Tests*						
Breusch-Godfrey Serial Correlation LM Test	F-Statistic	0.222	0.17	0.901	2.052	0.887	1.503
	Probability	F(2,21) 0.803	F(2,16) 0.845	F(2,13) 0.430	F(2,14) 0.165	F(2,18) 0.395	F(2,13) 0.259
Heteroskedasticity Test: Breusch-Pagan-Godfrey	F-Statistic	0.936	1.525	0.283	0.527	0.853	1.913
	Probability	F(10,23) 0.519	F(15,18) 0.196	F(17,15) 0.993	F(16,16) 0.395	F(3,20) 0.608	F(18,15) 0.105
Ramsey RESET Test	F-Statistic	0.491	1.268	0.032	0.522	1.395	1.242
	Probability	F(1,22) 0.491	F(1,17) 0.276	F(1,14) 0.861	F(1,15) 0.609	F(1,19) 0.886	F(1,14) 0.284
Normality Test:	Jaque-Bera	1.075	1.075	3.144	1.033	0.728	0.141
	Probability	0.584	0.584	0.156	0.597	0.695	0.932

Note: values in parentheses are the standard errors. *,**,*** implies significant at 1%, 5% and 10% respectively

Increase in exchange rate raises the size of reserve. This is possible, particularly in the period of depreciation or devaluation. In this period, export becomes cheaper while import becomes more expensive. Our result suggests that reserve increases by 0.1% for a 10 percentage increase (depreciation) in exchange rate. The mild effect of this magnitude is informed by other factors affecting export proceeds and import demand. Such factors include the presence of trade policy barriers, and trade facilitation issues. The presence of all these coupled with the sluggish response of imports to exchange rate changes did not allow reserves to benefit immensely from exchange rate depreciation. Another counterproductive of exchange rate depreciation that could work against external reserve improvement is terms of trade deterioration. If the price of export is cheaper than the price of import (due to depreciation), this creates disincentive to the economic agents and they may reduce supply, thereby further reducing the influence of depreciation on reserve.

Turning to external factors, that is, gas and oil prices, and remittances, it was discovered that gas price poses insignificant effect on external reserves. This suggests that returns from gas still lack the capacity to significantly influence external reserve in Nigeria. Unlike the gas price, oil price has both short run and long run positive influence on the Nigeria external reserve. Not only that, Nigeria's reserve is highly sensitive to changes in oil price. If international oil price increases by 10%, Nigeria external reserve will increase by around 7% in the short run and around 4% in the long run. The reason for this is that a large share of Nigeria's external reserves is from oil proceed and the revenue from oil is determined by the situation in the international oil market. Our result suggests that once oil price rises, oil proceeds will increase and this will unambiguously increase reserve. Considering the fact that Nigeria is a member of the Organization of Petroleum Exporting Countries (OPEC) where quota is given to members, an increase in price may not raise oil proceeds if quota is reduced. But our result shows that, the reserve is highly sensitive to changes in oil price.

Increase in remittances lead to increase in reserve in the short run. But in the long run, it shows negative effect. The effect of remittances in the short run may be positive since its effect on the economy many not be immediate. This is true because the beneficiaries are given the approximate naira equivalent of the amount remitted (based on the official exchange rate) while the foreign currency adds to reserves, at least in the short run. Furthermore, the coefficient of effect suggests that remittances is also important to external reserve in Nigeria, in the short run. A 10 percentage increase in remittances will lead to around 3 percent increase in external reserve in the short run.

Meanwhile, it was demonstrated that remittances influence reserve through inflation and exchange rates. The inflation and exchange rates channels are confirmed in the short run but only the exchange rate channel was confirmed in the long run. This outcome further confirms the use of nonsterilized intervention by the monetary authorities by providing additional channel through which inflation emerge in the economy. Evidence has it that a good percentage of remittances were spent more on the purchase of imported products than domestic products. In this case, demand raises price level and the monetary authorities tend to accommo-

date the inflation generated by altering the size of reserves.

Another channel through which remittances affect external reserve is the exchange rate. Since much of the remittances were spent on imported products, it is not surprising to find a mild but negative and significant effect of exchange rate interaction with remittances on reserves. Increase in remittances leads to appreciation of currency and this further creates opportunities to buy more of imported products, leading to current account deterioration and reduction in reserve. The mild effect suggests that remittances'influence on reserve through exchange rate is minimal, perhaps due to its size in total reserve.

Our result also shows that the effectiveness of remittances on reserve depends on the exchange rate regime, specifically in the period of flexible exchange rate. The breakpoint that shows a significant probability on reserve when interacted with remittances reveals this assertion. During flexible exchange rate, increase in remittances precipitates exchange rate, leading to increase in import demand and by implication, reduces external reserve. The effect is notable more in the long run than in the short run. This outcome provides another insight into remittance-reserve nexus in Nigeria. When Nigeria switches to flexible exchange rate, increase in remittances will lead to decrease in reserves. The effect is more pronounced in the long run as reserve reduces by 4% following a 10 percent increase in remittances if the country operates flexible exchange rate.

CONCLUSION AND POLICY RECOMMENDATIONS

This study provided additional information about the determinants of external reserves in Nigeria by examining whether remittances and other external factors matter for reserves. Several studies have investigated the determinants and reasons for reserves accumulation but most studies did not consider the influence of some external factors such as remittances. Omission of these variables may provide inadequate information for the policymakers especially in a country with huge remittance inflow. The theoretical literature unequivocally pointed out possible effects of international factors on reserves but little attention was paid to this in empirical works. Our result validated the importance of external factor in reserve model. Furthermore, our results discovered that the behaviour of reserve is anchored on the interplay between remittances, exchange rate regimes and inflation.

The ARDL method employed provides reliable information about how reserves respond to changes in any of its drivers. The result confirms the importance of both internal and external factors. Specifically, changes in oil prices and remittances influence changes in external reserves in Nigeria. Meanwhile, a nuance result from our finding is that in the short run, increase in remittances adds to reserve but in the long run, it reduces it. Also, the channel through which remittances reduces reserves was discovered. During the flexible exchange rate regime, increase in remittances causes reserve to fall due to large import demand and attendant current account deterioration.

The policy recommendations are that first, the internal policy should be used sparingly due to its negative effect. Perhaps Nigeria

reserves would have been more than what it is if the pattern of remittances were put to check. Thus, the authorities should use internal policy to make remittances investment funds rather than consumption funds. Making the environment conducive for investment should be one of the highest priorities on the policy options. Although one of the Central Banks policies on remittances was that recipients are to be paid in naira instead of hard currency at the point of collection. This policy may likely be helpful in monitoring exchange rate behaviour but will still not solve the problem of ostentatious spending, which will later affect reserves. Furthermore, the policy may discourage the spirit of remitting due to multiple charges (charges at the point of sending, lack of exploitation of arbitrage opportunities and charges at the collection centers). Provision of social and economic infrastructure, industrialization and special saving treatment for remitters would have been better options.

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